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THE Washington Area Scanner Club

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EMERGENCY MEDICAL SERVICES (EMS) COMMUNICATIONS SYSTEMS

By Alan Henney

An accident on Eastern Avenue one evening brought several DC and Montgomery County EMS units to my side of town. Judging from the conversations over the police and fire channels, I knew several people were injured. It wasn't, however, until I heard the consultation between DC Medic 18 and MedSTAR (Washington Hospital Center's trauma unit) that I realized the seriousness of the situation.

The paramedic aboard Medic 18 informed MedSTAR (over Med-6) that they were enroute with the first of three accident victims. Medic 18, unlike the other two medic units, had no vital signs to provide to MedSTAR. Medic 18's patient, the paramedic said, was a "working code" - a quasi-medical term implying CPR in progress (not a good indication to say the least).

Meanwhile, on the Fourth District police channel, the first MPD (Metropolitan Police Department) scout car was sent to the accident scene. The dispatcher told the officer that Montgomery County was on the scene of the accident and that it was serious. For 15 minutes after receiving word of the accident, MPD had had no one available to send. Montgomery County Police came to the rescue this time, but MPD isn't always that fortunate. EMS units in the District often arrive at an accident scene and even transport victims prior to the arrival of MPD.

This incident is an example of how a balance of fire, law enforcement and EMS frequencies gives scanner enthusiasts a good feel for the city during nearly any situation. Frequencies used for ambulance to hospital consultations provide vital information and shouldn't be overlooked.

Radio communication between hospitals and EMS units generally takes place on the VHF high band (155 MHz) or on the UHF (463 MHz) band. Some jurisdictions, however, make extensive use of conventional or cellular telephone circuits for hospital consultations. A few jurisdictions, like Fairfax County, patch EMS units through to hospitals over an available fire channel. Still others rely heavily on fire dispatchers to relay messages between EMS units in the field and hospital emergency room medical personnel.

EMS communications system development expanded in the 1970s with a substantial investment in VHF high band (155 MHz) radio equipment. In the immediate Washington area most of the 155 MHz frequencies are used for intra-hospital communications (paging, security, maintenance and so on). The further you go out into Virginia, the more the 155 MHz channels buzz with rescue squad activities and ambulance to hospital communications. Many rescue squads throughout Virginia became loyal users of the VHF frequencies (Table 1) - with 155.205, 155.28, 155.34 and 155.4 being some of the most popular.

Table 1.
VHF High Band Special Emergency Frequencies

155.1600 s	155.2950 s
155.1750 s	155.3250 s
155.2050 s	155.3400 s
155.2200 s	155.3550 s
155.2350 s	155.3850 s
155.2650 s	155.4000 s
155.2800 s	

The 155 MHz special emergency frequencies quickly became cluttered with all sorts of routine communication forcing EMS providers to seek alternatives. In addition, more jurisdictions placed advanced life support units into operation, and the ability to transmit electrocardiographic telemetry became increasingly more important. Not only did the FCC generally prohibit telemetry on the VHF channels, but users found communications coordination lacking. Few standard channel designations existed, and most users had the capability of useing only a few selected channels. No user held a license for all 13 channels. The 155 MHz channels could no longer keep up with the demand.

In response to these various difficulties, EMS planners designed a newer radio system. Ten UHF frequency pairs (Table 2), officially designated by the FCC as "Med-1" through "Med-10," satisfied the need for both standard channel designations and for telemetry compatibility. To further standardize the radios, EMS planners designated eight CTCSS frequencies as Tones A through G (Table 3).

Unlike the 155 MHz channels, the 463 MHz channels are solely used for communications between EMS units, medical facilities and emergency operations centers. Hospital security operations, which thrive on the 155 MHz allocations, are prohibited on the 463 MHz band.

Table 2.
UHF Med Channels

Base	Mobile	Channel
462.9500	467.9500	Med 9 (Call 1)
462.9750	467.9750	Med 10 (Call 2)
463.0000	468.0000	Med 1
463.0250	468.0250	Med 2
463.0500	468.0500	Med 3
463.0750	468.0750	Med 4
463.1000	468.1000	Med 5
463.1250	468.1250	Med 6
463.1500	468.1500	Med 7
463.1750	468.1750	Med 8

Table 3.
Common Med Channel CTCSS Frequencies

Tone A	127.3 Hz
Tone B	146.2 Hz
Tone C	167.9 Hz
Tone D	192.8 Hz
Tone E	136.5 Hz
Tone F	156.7 Hz
Tone G	131.8 Hz
Tone H	173.8 Hz

The primary purpose of the 10 Med channels, which are used by nearly every area jurisdiction (including some private ambulances), is to facilitate medical communications (both voice and EKG) between medical facilities and EMS units. For this reason, Med radios typically allow the user to select channels (and CTCSS frequencies) used by other jurisdictions.

Due to the large number of Med channel users, interference is common. In an effort to reduce this problem, Med channels operate almost entirely in the duplex mode - requiring scanner listeners to monitor both the mobile and base on separate frequencies.

Med-1 through Med-8 are usually reserved for consultations between hospitals and EMS mobile units. The two call channels (Med-9 and -10) on the other hand, are reserved for EMS dispatching (in some areas) or for direct communications with an EMS dispatcher. In Maryland, the Baltimore region uses Med 9 (Call 1) as its primary call channel - leaving the rest of the state on Med 10 (Call 2). EMS dispatchers often assign one of the first eight Med channels to EMS units for medical consultations.

Most medical facilities don't actually transmit on the Med channels. When an EMS unit requires a medical consultation, the local EOC merely patches (by land-line) the hospital through the EOC's EMS radio system. Table 4 lists the primary Med channels for area jurisdictions. The order of assignment varies depending upon channel availability.

Table 4.
Med Channel and Tone Code Assignments

Jurisdiction	Tone	Med Channels
Alexandria, VA *	F	3, 4, 5, 8
Allegany, MD	A	7
Anne Arundel, MD	C	4, 8
Arlington, VA	C	5, 6, 7, 8
Baltimore, MD	C	4, 8
Baltimore City, MD	C	2, 3
Calvert, MD	A	3
Caroline, MD	A	1
Carroll, MD	C	4, 8
Cecil, MD	B	5
Charles, MD	C	8
Dorchester, MD	C	5
Fairfax, VA *	H	4, 5, 7, 8
Fauquier, VA	F	2, 4, 7, 8
Frederick, MD	B	6
Garrett, MD	B	3
Harford, MD	C	4, 8
Howard, MD	C	4, 8
Kent, MD	C	6
Loudoun, VA	G	3, 4, 6, 8
Montgomery, MD	A	2, 5
Prince Georges, MD	B	1, 7
Prince William, VA	D	1, 4, 6, 8
Queen Annes, MD	C,A	6, 1
Saint Marys, MD	B	4
Somerset, MD	A	4
Talbot, MD	A	1
Washington, DC	D	3, 6, 8
Washington, MD	C	1
Wicomico, MD	B	2
Worcester, MD	A	4

* - Jefferson Hospital uses Fairfax County Med channels with Alexandria's tone (Tone F).

DC EMS Radio Troubles

In the District of Columbia, the situation is a bit unusual to say the least. For years DC dispatchers connected DC medic units to medical facilities over one of the 10 Med Channels (typically Med-6). Last July, lightning struck a 200 foot DC Fire antenna tower on MacMillan Drive, NW and everything changed. Besides temporarily paralyzing the VHF fire communications system, the 10 EMS Med channels were left permanently damaged. Cellular telephone, according to an article in the November Washington Post, replaced the Med radio on the seven city operated medic units. The cellular phones will remain in the medic units until a new EMS communication system is in place.

Despite of the lightning damage, Med channels in the District still remain active. Children's Hospital and Washington Hospital Center's MedSTAR trauma center, for example, maintain their own transmitters on some (if not all) of the 10 UHF Med channels. MedSTAR 1, the WHC's med-evac helicopter, makes extensive use of Med-10 (462.95s) for its operations.

Table 5.
Med-Evac Helicopter Communications

44.7400 s [110.9]	Maryland EMS Helicopter Coordination
45.0200 s [?]	Delaware State Police Helicopter Coordination
47.6600 s [110.9]	Maryland EMS Helicopter Medical Consultations
122.7500 s	Air to Air Coordination (Common)
122.8500 s	Maryland EMS Helicopter Coordination
123.0500 s	Helipad Coordination (Common)
460.1250 r [107.2]	Fairfax County EOC Helicopter Coordination
462.9500 s [203.5]	Washington Hospital Center "MedSTAR 1"
462.9750 s [173.8]	Fairfax Hospital "AirCare 1"

The very high speed data bursts monitored over 44.74 are for the automatic helicopter flight following system. This system displays the helicopter's exact location on a map at the University of Maryland's EMS center (SysCom) in Baltimore. While airborne, med-evac helicopters frequently had caused interference to distant stations monitoring one of the Med channels. To avoid this problem, Maryland EMS helicopters now use 47.66 (and in the future 47.5) for medical consultations. SysCom can patch nearly any medical facility through to med-evac helicopters on 47.66 when necessary.

NEW COLUMN

As a professional journalist, Brent Baker finds many articles of interest to scanner enthusiasts each month. We are delighted that he has volunteered to write this regular column summarizing such articles.

NEWSCAN

By Brent Baker

GMU RADIO CALL BOXES. "Emergency call boxes with two-way radios linked to campus police have been installed at George Mason University to increase security," the Fairfax Journal reported. According to the March 25 article, radios in the 13 boxes connect the user with a campus police dispatcher. Another 12 boxes will be installed next year.

VOLUNTEER RESCUE SQUAD SAVES MONEY. As governments around the beltway are raising taxes and/or cutting services, a March 23 Washington Post profile of the Bethesda-Chevy Chase Rescue Squad revealed what a good deal volunteers are for taxpayers. Reporter Erin Marcus explained: "In Montgomery County, officials estimate they spend less than $100,000 in county money annually on the B-CC squad, whose members raise more than $500,000 a year through private donations. The squad pays for its own equipment and for eight EMTs to work weekdays, while the county supplies radios and pays the salaries of two paramedics who work at the station on weekdays." The rest of the time, volunteers man the station. Statewide, 7,500 volunteer EMTs save Maryland taxpayers $90 million a year.

Some other interesting facts:
– Ten people "live at the station full time and don't pay rent, but have to ride along when an extra worker is needed."
– There are 141 active members who "have to spend at least one 12-hour night shift a week at the station, working from 7 at night until 7 in the morning."

PG VOLUNTEERS FIGHT $ DROP. The PG County Volunteer Fire and Rescue Association is fighting to restore its funding to the 1990 level. An April 8 Washington Times story reported "the firefighters are slated to receive $6.4 million in fiscal 1993, the same amount they received this year and $700,000 less than they got in 1990." The volunteers told the Times they "save the county about $21.5 million a year in personnel costs in the county's 47 stations – of which 39 stations are owned by volunteer companies. They said they also have provided the county with about $10 million worth of firefighting equipment since 1987 -- including 40 pumpers, three ladder trucks, three rescue squads and eight ambulances."

FAIRFAX 911 BACK-UP. In March, many of us toured the state of the art Fairfax County Emergency Operations Center (EOC). An April 14 Fairfax Journal article reported the county is also going first class with its new back-up EOC which is expected to be operational by May 1. Housed in a C&P building in the 6500 block of Little River Turnpike, the center cost $242,000 to set up, plus another $77,000 in annual rent for 3,000 square feet of space. Of the total cost, $60,000 went to buy radio equipment. Journal reporter Mark Grossman explained: "By placing the reserve system in a telephone office building, the county is almost guaranteed instant access to emergency telephone lines and back-up electrical power in case disaster cuts off the main system, said Mike Fischel, director of Fairfax County's Public Safety Communications Center."

FAIRFAX CUTS PHONES. The Fairfax County Board of Supervisors have targeted car phones in their quest to reduce spending. Who exactly will lose their phones is not clear, but the April 1 Washington Times reported 194 county employees have cellular phones, costing $104,000 a year.

DC POLICE LACK EQUIPMENT. It's been reported before, but a March 22 Washington Times story again described how the D.C. police lack basic equipment neighboring departments take for granted:

-- "A shortage of typewriters and computers throughout the Metropolitan Police Department forces officers to produce handwritten reports. Sometimes those reports have been so illegible that cases have been dropped."

-- Most police phones are rotary, not touch-tone. "The outdated equipment causes numerous problems. For instance, officers can't leave voice-mail messages or call pagers, making it difficult to communicate with other police departments and federal prosecutors." Only the new 7D station is fully touch-tone equipped. In contrast, a "survey of 12 area police departments shows all switched to touch-tone phones sometime in the 1970s."

-- Compounding the phone problem, Chief Isaac Fulwood refuses to let detectives carry pagers. Many buy their own because there is often no way to leave a message after 5 p.m. One detective said he wants to make sure his spouse and important witnesses can reach him at any time.

PERSONAL COMPUTERS AND FREQUENCY DATABASES

By Joe Gallagher

During one of the Kensington meetings earlier this year, several of us shared the various methods we use to save frequency information on our PCs. Computer databases, many of us find, are ideally suited for storing frequency data.

Scanner enthusiasts use numerous techniques to store frequency information. The technique presented this month is perfect for those who desire to limit record width to 80 columns - without the use of an actual database program.

This particular database format requires little overhead. Saving the database as an ASCII file allows us to take advantage of several DOS programs. The operator may query the database by merely using FIND.EXE - a DOS program found in nearly all releases of DOS. Entering **FIND "TAC3" FILENAME.EXT** at the DOS prompt, for example, displays all lines containing the **TAC3** character string. The DOS SORT.EXE program works similarly as well - consult your DOS manual for details. Sorting functions found in word processors, such as WordPerfect and WordStar, quickly sort the listing as well.

Examples of my database layout:

Column(s)	Field Name
01 through 06	Usage/Type (POLICE, FIRE, AIR,...)
07 through 08	Blank
09 through 16	Frequency in MHz to four decimal places (i.e. 460.3250)
17	Blank
18 through 19	State (Post Office style)
20	Blank
21 through 30	City or County (No spaces or punctuation)
31 through 32	Blank
33 through 80	Description

Format of the Description field appears as below:

The description field begins with "(CITY)" or "(COUNTY)" if distinctions exist (as in the case of Fairfax City and County).

Then, identify the agency consistently (as in "MPD" or "U-S PARK POLICE").

Channel designations appear next - inside single quotes ('A11'). Frequency nicknames ('TAC1') precede the channel designation.

A brief description of channel usage follows the channel designation. A dash indicates 'to' (CAR-CAR), and a slash means "and" or "or" depending on the context (SEARCH/RESCUE).

Finally, the frequency which this frequency feeds or repeats, or its frequency pair (in a duplex system) appears last (remove trailing zeros).

Additional lines with the identical data for columns 1 through 32 provide more comment space for a specific frequency.

When sorted by frequency, several listings many appear for a single frequency as in this example:

```
AIR      122.7500 VA ARLINGTON   DCA UNICOM
UNICOM   122.7500 VA ARLINGTON   DCA AIR-AIR
MEDIA    122.7500 DC WASHINGTON  TRAFFIC PLANES AIR-AIR
TRAFFI   122.7500 DC WASHINGTON  AIR-AIR
UNICOM   122.7500 US NATIONWIDE  AIR-AIR
```

This technique is useful when you hear a frequency but don't know the type of use or the user. But if you want to locate the traffic aircraft air-to-air frequency (and don't have a clue where it might be), sort the list by type (the first column) and the five entries above would appear in the list of aircraft, AND in the section for UNICOMs, AND in the media section, AND in the traffic frequency section.

Example when sorted by frequency:

```
POLICE   460.3250 DC WASHINGTON  MPD '12A' '12B' '12C' '12D' 'CITYWIDE 1'
POLICE   460.3250 DC WASHINGTON  MPD SOD/CID/EMERGENCIES/TRAFFIC (RPTS 465.325)
POLICE   460.3500 DC WASHINGTON  MPD '1A' DIST. 1 DISPATCH/METRORAIL TUNNELS
POLICE   460.3750 VA ALEXANDRIA  MOBILE DISPATCH TERMINALS (MDT) RPTS 465.375
MDGOV    460.5500 MD BALTIMORE   (CITY) VEHICLE REPAIRS
FIRE     460.5500 VA FAIRFAX     (COUNTY) '4' FIREGROUND/HOSP COMMS/MUTUAL AID
FIRE     460.5500 VA FAIRFAX     (COUNTY) '4' (RPTS 465.55)
FIRE     460.5500 VA FAIRFAX     (COUNTY) '9' 'TAC4' LO POWER SIMPLEX COMMS
FIRE     460.5750 MD HARFORD     (COUNTY) '1' DISPATCH
FIRE     460.5750 VA FAIRFAX     (COUNTY) '1' DISPATCH (RPTS 465.575)
FIRE     460.5750 VA FAIRFAX     (COUNTY) '6' 'TAC1' LOW POWER SIMPLEX COMMS
FIRE     460.6000 MD HARFORD     (COUNTY) '2' FIREGROUND
FIRE     460.6000 VA FAIRFAX     (COUNTY) '2' FIREGROUND/HOSP COMMS/MUTUAL AID
FIRE     460.6000 VA FAIRFAX     (COUNTY) '2' (RPTS 465.6)
FIRE     460.6000 VA FAIRFAX     (COUNTY) '7' 'TAC2' LOW POWER SIMPLEX COMMS
FIRE     460.6250 MD HARFORD     (COUNTY) '3' ALTERNATE FIREGROUND
FIRE     460.6250 VA FAIRFAX     (COUNTY) '3' FIREGROUND/HOSP COMMS/MUTUAL AID
FIRE     460.6250 VA FAIRFAX     (COUNTY) '3' (RPTS 465.625)
FIRE     460.6250 VA FAIRFAX     (COUNTY) '8' 'TAC3' LOW POWER SIMPLEX COMMS
```

What's missing:

CTCSS frequencies (My PRO2004 and newest Fairmate HP2000 hand-held radio can't make use of them).

Call signs (I don't know Morse code - used by many licensees for station identification).

Latitude/longitude (I figure the city is good enough - especially when you already know whether it's police, FBI or whoever).

The most recent additions and modifications to my list have an underscore to the right of the "City" field ("WASHINGTON_" or "FAIRFAX_") indicating verification.

The missing items were sacrificed in the flat ASCII file (rather than using a database such as dBase). The original intent was to upload this file onto a UNIX system for use by coworkers. The flexible record format allows the user to print the database with little trouble - as all records fit within the 80 column character width.

Hey scanner/computer users: Let us know how you store your frequency lists! MP

DATES TO REMEMBER

Sat, May 16 **1 to 4 pm**	**Hyattsville Library Gathering** **6530 Adelphi Rd**	**Alan** **301-270-2531**
May 22 & 23	Annual Open House, Andrews Air Force Base, 301-568-5995 (recording)	
Sun, May 24	Maryland FM Assoc Hamfest, Howard County (MD) Fairgrounds	
Sun, Jun 21	Frederick Hamfest, Fredrick County (MD) Fairgrounds	

Next CHM Meeting Details: On Saturday, May 16 at 1 p.m. we'll have our next gathering at the Prince George's County Memorial Library in Hyattsville. **All are invited to attend!** You'll find the library at 6530 Adelphi Road near the Prince George's Plaza. Please call Alan if you require additional details. A couple surprise guest speakers are scheduled to attend. See you there!

Newsletter Staff:
Dr. Willard Hardman, Executive Editor
Alan Henney, General Editor
Brent Baker, Newscan Editor
Mike Peyton, Managing Editor
Cecil Riley, Acting Treasurer

Meeting Coordinators:
Ken Fowler, Virginia Coordinator (703-385-2165)
Mike Peyton, Maryland Coordinator (301-933-2273)

Computer BBS: the Frequency Forum (703-207-9622)

Membership dues and information:
Cecil Riley
549 Florida Ave, Unit 103
Herndon, VA 22070
703-318-7416 home (M-F 11am-2pm)

All other correspondence:
(submit articles, freq. requests,... SASE please)
Alan Henney (301-270-2531)
6912 Prince Georges Ave.
Takoma Park, MD 209012-5414

Published on a monthly basis, the Capitol Hill Monitor keeps scanner enthusiasts informed of local meetings, frequency profiles and other topics of interest to area scanner listeners. The membership rate thrcugh December, 1992 is $8. Kindly make checks payable to Cecil Riley.

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CAPITOL HILL MONITORS
C/O ALAN HENNEY
6912 PRINCE GEORGES AVE
TAKOMA PARK MD 20912-5414